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CLARK FORK SUPERFUND

MASTER PLAN

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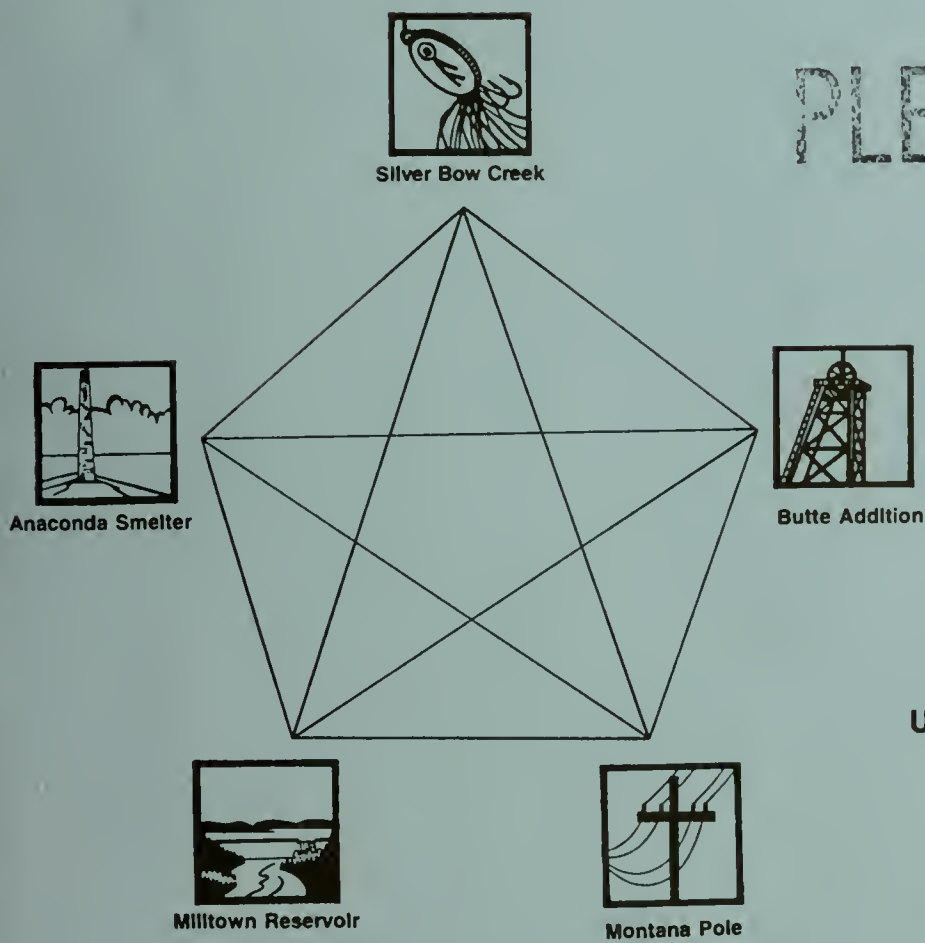

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THIS DOCUMENT HAS BEEN PREPARED FOR PUBLIC DISTRIBUTION BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND THE MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES TO DESCRIBE SUPERFUND ACTIVITIES IN THE CLARK FORK RIVER BASIN. THE SCHEDULES PRESENTED IN THIS MASTER PLAN ARE THE BEST PRESENT ESTIMATES FOR COMPLETING THESE ACTIVITIES. THE SCHEDULES WILL BE UPDATED PERIODICALLY AS WORK CONTINUES AND NEW INFORMATION BECOMES AVAILABLE. PUBLIC COMMENT ON THE PLAN IS INVITED. COMMENTS SHOULD BE ADDRESSED TO THE EPA OR STATE CONTACTS LISTED IN THE COMMUNITY INVOLVEMENT SECTION ON PAGE 7 OF THIS PLAN.

PREFACE

This Master Plan has been developed by the U.S. Environmental Protection Agency (EPA) and the Montana Department of Health and Environmental Sciences (MDHES). It describes the overall general approach being used to address concerns regarding hazardous substances, pollutants, and contaminants at the Superfund sites in the Clark Fork Basin. The detailed technical approaches being used at specific Superfund sites are described in site-specific workplans which are available to the public at Superfund document repositories throughout the Clark Fork Basin. The coordination of these technical approaches is accomplished through active communication among all Superfund project managers and the Superfund Coordinator.

The scope of Superfund problems and specific human health and environmental concerns associated with each site are discussed in Section 2 and the Appendix of the Master Plan. The Superfund effort in the Clark Fork Basin encompasses the largest geographic area of all Superfund assignments in the United States. The number and complexity of existing and potential human health and environmental problems in the basin require that priorities be set for response actions. The approach that EPA and MDHES have used to prioritize response actions is explained in Section 3. This prioritization process has resulted in identification of three broad categories of Superfund problem areas: problems primarily related to human health, problems which primarily affect the quality of Silver Bow Creek, and problems which relate primarily to the Clark Fork River and adjacent areas. The technical and legal interrelationships among these categories and among sites are discussed in the Master Plan. Section 3 also summarizes the major accomplishments of the Superfund program at the Clark Fork sites.

Federal laws governing Superfund response actions require that technical and legal issues be addressed in a well documented and consistent manner at all sites. The Superfund process is outlined and mechanisms available to implement interim and final response actions are described in Section 4. The influence of site interrelationships on the process and schedule is discussed in light of the need for effective, coordinated response actions. A schedule for addressing Superfund problem areas, which is based on information currently available to EPA and MDHES, is presented in Section 5. This Master Plan will be updated periodically as cleanup activities progress. EPA and MDHES welcome public comments on the information presented in this Master Plan.

1.0 INTRODUCTION

1.1 GOALS AND OBJECTIVES

This Master Plan has been prepared for public distribution by the U.S. Environmental Protection Agency (EPA) and the Montana Department of Health and Environmental Sciences (MDHES) to provide a better understanding of the overall approach being used to manage Superfund activities in the Upper Clark Fork Basin of southwestern Montana. These activities are being conducted under authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or "Superfund" which was passed by Congress in 1980 and amended in the Superfund Amendments and Reauthorization Act of 1986. Appropriate state authorities are also utilized in the Superfund process.

Superfund activities in the Clark Fork Basin are focused on reducing risks to human health and the environment from the release or threatened release of hazardous substances, pollutants, or contaminants primarily from past mining and smelting activities.

Other Federal, State, and local agencies are also conducting natural resource investigations in the Basin. These investigations have been summarized in a report prepared by the Governor's Clark Fork Basin Project (Johnson and Schmidt, 1988). In addition to integrating appropriate information from these investigations, Superfund activities in the Basin must be conducted in a specified manner as required by CERCLA and the **National Contingency Plan (NCP)**[1] which guides technical implementation of Superfund activities.

To ensure that effective response actions are achieved, Superfund activities must be coordinated so that the technical and legal requirements of CERCLA and the NCP are met. In addition, consistent approaches to response actions must be followed since study results and response actions at one location will affect these activities at other contaminated sites. To assist in coordinating response actions in a technically and legally-consistent manner, EPA has developed guidance for the Superfund program throughout the country. Interpretation and application of this guidance to achieve appropriate consistency among sites is achieved through active communication among the Superfund project managers, the Superfund coordinator, and other staff.

This Master Plan was developed to aid the public in understanding how requirements of the Superfund process relate to response actions which are being planned or implemented at the Superfund site. Some specific objectives of the Master Plan are to:

- identify, prioritize, and coordinate inter-site activities to achieve the most rapid and effective investigation and, where necessary, remediation of the Clark Fork Superfund sites as possible;

1. Terms which appear in bold face type on first mention are defined in the glossary on page 11 of this document.

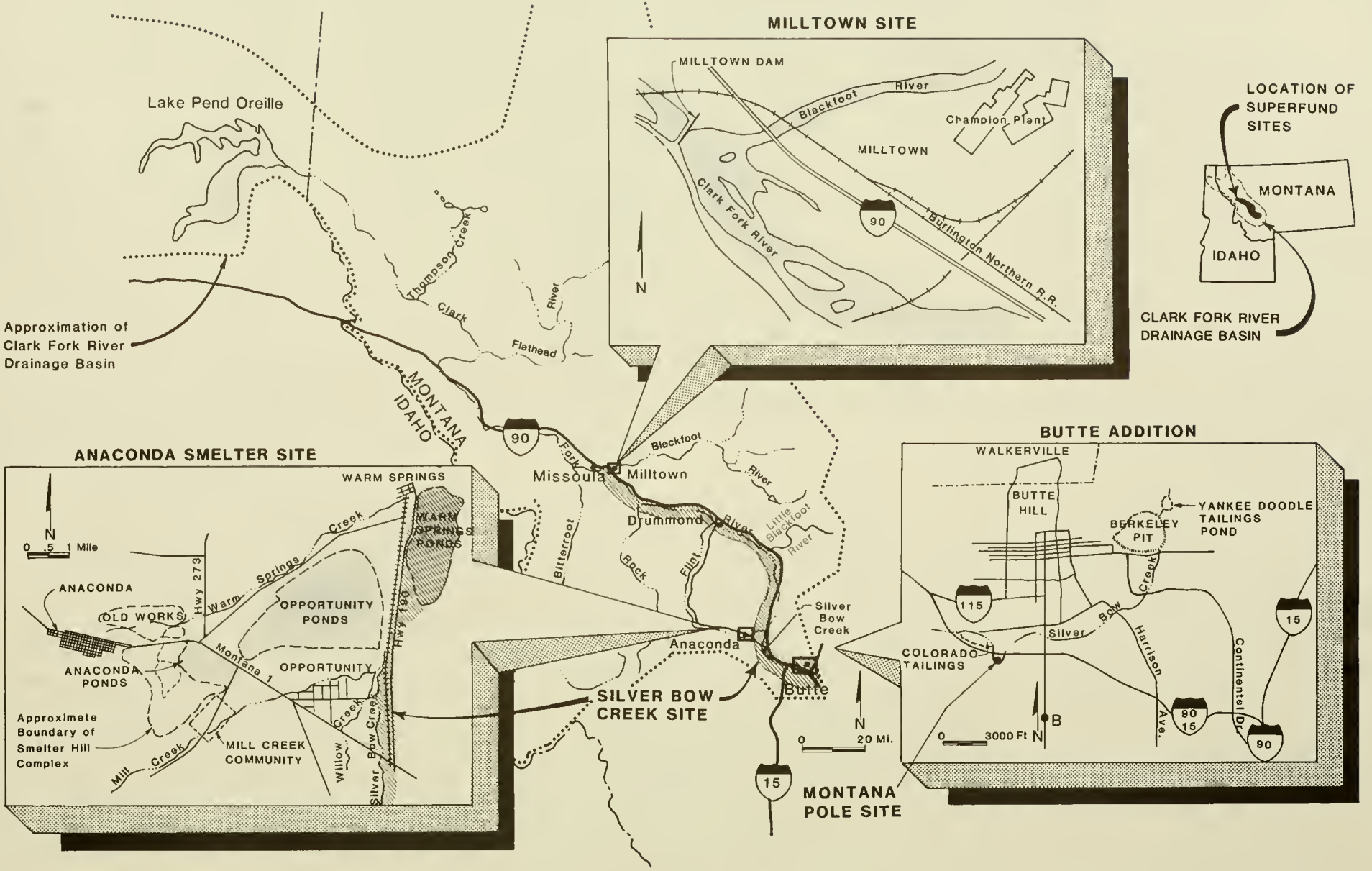


Figure 1. Location of Superfund Sites in the Clark Fork River Basin.

- coordinate Superfund activities with other environmental improvement programs;

- provide for consistent approaches to response actions for all sites;

- communicate information on Superfund activities to all interested parties.

A projected schedule for addressing contamination problem areas is included in this Master Plan. This schedule will, of necessity, be modified and updated as new information becomes available and major decisions are made.

1.2 HISTORICAL BACKGROUND

The EPA and the State of Montana are working together in the Superfund program to seek solutions to the impacts from hazardous substances (primarily metals) left by over 100 years of mining and processing operations, as well as other industrial activities. The area of concern includes the Upper Clark Fork Basin above Warm Springs Creek and the main stem of the Clark Fork River to the Bitterroot River below Missoula, Montana.

Investigations in the upper Clark Fork area, initiated by EPA in 1982, resulted in the establishment of four separate but contiguous Superfund sites. The sites are the Milltown Reservoir site, the Anaconda Smelter site, the Montana Pole site, and the Silver Bow Creek/Butte Addition site (See Map, page 2). EPA and MDHES initially identified 77 existing or potential contamination problems at the sites. As described in Section 3, these problems have been consolidated where possible for more efficient responses. EPA has provided funds to MDHES to take the lead for investigations at the Silver Bow Creek site, the Montana Pole site, and the Milltown Reservoir site. The Atlantic Richfield Company (ARCO) is conducting investigations at the Anaconda Smelter site and may undertake work at other sites. EPA also intends to offer the opportunity to potentially responsible parties to conduct the investigations for the Butte Addition to the Silver Bow Creek site under an enforcement agreement (see *Section 4.4 Superfund Enforcement Authorities).* EPA is managing response actions for the Butte Addition.

In an effort to develop an integrated approach for addressing these sites, EPA, MDHES, the Montana Governor's office, representatives from the communities of Butte and Anaconda, and the Atlantic Richfield Company (ARCO) have provided input to this Master Plan to help define investigation and remedial priorities and establish a schedule for coordinated action.

2.0 PROBLEM AREA DEFINITION

Each Clark Fork Superfund site is comprised of several existing or potential contamination problems. The most important problems are summarized for each site in the Appendix. The history and interrelationships of problems among sites are described further in the narrative below. The major corrective actions that have already been taken at each site are described in Section 3.3.

2.1 MILLTOWN RESERVOIR SITE

Milltown Reservoir is located adjacent to Milltown, Montana at the confluence of the Blackfoot and Clark Fork Rivers. Milltown Reservoir was created in 1907 as part of a hydroelectric power generating facility which has been owned and operated since 1929 by Montana Power Company. The reservoir has accumulated 6.5 million tons of sediments transported by the Clark Fork River and its tributaries (Woessner et al., 1984). Unusually high concentrations of arsenic, lead, zinc, cadmium, and other metals have been found in reservoir sediments. These contaminants have been transported from the reservoir sediments into the shallow ground water that provided drinking water for Milltown residents. The reservoir was designated a Superfund site in September 1983.

2.2 ANACONDA SMELTER SITE

The Anaconda Smelter is located at the southern end of the Deer Lodge Valley, approximately 25 miles northwest of Butte.

Ore from the Butte area mines was transported to Anaconda and processed at various locations (Old Works, Arbiter Plant, and Smelter Hill) from 1884 to 1980. Ore processing wastes, including about 185 million cubic yards of tailings, about 27 million cubic yards of furnace slags, and about 250,000 cubic yards of flue dust (CH2M Hill, October 1984), are contained within an area of more than 6,000 acres and contain elevated concentrations of copper, cadmium, arsenic, lead, and zinc. The Anaconda Smelter area was designated as a Superfund site in September 1983.

Tailings were typically deposited in ponds where solids were allowed to settle before the wastewater was recycled or released into nearby watercourses. These ponds (Anaconda, Opportunity, Bradley, and Iron) were created by a series of dikes which have left mounds of tailings as deep as 90 feet. These ponds contain various wastes which have led to ground water and surface water quality degradation. Additionally, emissions from the smelter stack have resulted in soils contamination throughout a broad area of the upper valley.

2.3 MONTANA POLE SITE

The Montana Pole site encompasses approximately 40 acres immediately south of Silver Bow Creek at the southwest edge of Butte. From 1947 to 1983 the Montana Pole Treating Company treated poles with pentachlorophenol (PCP) and creosote at this site. In 1983, seepage of these wastes from the Montana Pole site into Silver Bow Creek was estimated to be two to five gallons per day. The site was designated a Superfund site in November 1986.

2.4 SILVER BOW CREEK/ BUTTE ADDITION SITE

Following the discovery of gold in 1864, the Butte area became an internationally recognized mining center with over 300 combined copper and silver mines, 9 silver mines, and 8 smelters in operation during 1884. In 1955, excavation of the Berkeley Pit began and mining continued until 1977. Silver Bow Creek has historically received discharge from mining, smelting, wood treating, and other industrial sources for over 100 years.

The Silver Bow Creek site was designated a Superfund site in September 1983. The original site encompassed the floodplain of Silver Bow Creek from Butte downstream to the Warm Springs Ponds. Remedial investigations were initiated within this area during 1985. In November 1985, the boundaries of the site were expanded to include the Butte area. Downstream portions of the Clark Fork River floodplain from Warm Springs Ponds to Milltown Reservoir were identified as an expanded study area.

Today mining, milling, and smelting wastes exist as sources of soil, water, and air contamination throughout the Butte area. Contaminated surface water runoff from the Butte area discharges directly to Silver Bow Creek. In addition, underground mines in the area are filling and generating acid water as water levels rise. During active mining, these mines were dewatered by a network of pumps with some water being recycled and some being discharged to Silver Bow Creek. It is estimated that over 3,500 miles of underground mine workings are interconnected with the Berkeley Pit. These mines contain approximately 11.2 billion gallons of acid mine water (CDM 1988). Initial investigations suggest that within eight years at the earliest, water in the Berkeley Pit may rise to a level where acid mine drainage could contact the bedrock/alluvium interface with the possibility for contamination of Silver Bow Creek.

In addition to contaminants from the Butte area, the Montana Pole and Rocker wood treating sites contribute to the contaminant load of Silver Bow Creek. Continuous deposits of metals-laden sediments and tailings lie within the floodplain and contaminate surface and ground water along Silver Bow Creek and the Upper Clark Fork River. The Anaconda Smelter site also has contributed contamination to the Clark Fork River.

2.5 INTERRELATIONSHIPS AMONG SITES

Geographic, technical, and legal interrelationships among Superfund sites in the Clark Fork Basin dictate that close coordination will be required during implementation of this Master Plan. Due to their geographic proximity, all Superfund sites are sources of contamination to Silver Bow Creek and/or the Clark Fork River. As a result of this interrelationship, response actions need to be coordinated so that downstream, downgradient, or downwind sites are not recontaminated, following cleanup, by upstream, upgradient, or upwind sites. Another similarity among these sites is the problem of dealing with large volumes of mining wastes which contain similar metallic contaminants. The sites also share similar pathways through which human health and the environment are adversely affected. Due to geographic proximity and similarities of waste characteristics, response action criteria which are established for these sites will be closely related. For the same reason, response actions appropriate at one mining waste site may also be appropriate at other sites.

All of these interrelationships among Superfund sites in the Clark Fork Basin require that response actions are carefully coordinated to ensure that effective solutions are identified and implemented in an appropriate sequence. The overall purpose of this continuing master planning effort is to ensure that activities being conducted at individual sites complement each other and lead to the most efficient response possible.

3.0 ADDRESSING OPERABLE UNITS

In order to manage the interrelated problems identified at the four Clark Fork Superfund sites, EPA and MDHES have consolidated the 77 potential contamination problems into 25 **Operable Units.** An operable unit is a clearly defined, smaller portion of the overall work to be completed at a Superfund site. Each operable unit is generally investigated and remediated on an individual basis. The criteria used to designate operable units are:

- Areas with similar contaminated media (soils, flue dust, ground water, etc.);
- Areas within a similar geographic area;
- Areas that will be remediated using similar techniques;
- Areas that will be remediated within a similar time frame; and
- Areas that can be managed and addressed as an individual RI/FS.

These 25 operable units are subject to change as more information becomes available. For example, it may be possible to further consolidate operable units if additional similarities between individual units are identified, or further investigation may show that the consolidated operable units must be broken back down into smaller, more manageable units to carry out appropriate remedies.

3.1 CRITERIA FOR ESTABLISHING PRIORITIES

Since there are so many Superfund problems to be addressed, priorities are established to ensure the most serious problems are dealt with first. The EPA and MDHES have identified high, medium, and low priority operable units according to the sequencing criteria listed in Table 1.

Table 1:
Criteria for Establishing Priorities for Operable Units

High Priority Sequencing Criteria:
1. High potential human health exposure
2. High potential environmental exposure
3. Provides critical-path data needed to fully address other operable units

Medium Priority Sequencing Criteria:
1. Medium potential human health exposure
2. Medium potential environmental exposure
3. Potential for recontamination of other operable units located downstream, downgradient, or downwind
4. Unusually complex problem requiring lengthy evaluation

Low Priority Sequencing Criteria:
1. Low potential human health exposure
2. Low potential environmental exposure
3. Low present human health or environmental exposure but potential future exposure
4. Low risk of off-site contamination

The sequencing criteria are ranked according to several factors. Human exposures are generally given a higher ranking than other criteria. There is recognition that some human health concerns pose an immediate health risk that should be dealt with as a removal action. Other health concerns involve chronic risks over a lifetime of exposure that can be responded to with a later, longer-term action. In total the sequencing criteria provide for the orderly resolution of human health and environmental concerns at the Superfund sites.

3.2 RANKING OPERABLE UNITS

Each of the 25 operable units was evaluated against the criteria shown above and placed into a high, medium, or low priority category. This ranking is presented in Table 2. Each of these operable units is shown on the master schedule in Section 5.

3.3 ACCOMPLISHMENTS

A significant amount of work has already occurred on many of these operable units. This section briefly summarizes the efforts to date.

3.3.1 Milltown Reservoir Site

In 1983 a **Remedial Investigation/Feasibility Study (RI/FS)** was initiated by MDHES and EPA. As a result of these studies, EPA provided funds for a new water supply system for Milltown in 1985. RI/FS activities are continuing at Milltown under the lead direction of MDHES. These studies will address the need for, and possible solutions to, the contaminated reservoir sediments and ground water at Milltown. In addition, these studies are being expanded to determine if releases of hazardous substances, pollutants, or contaminants have occurred, or have the potential for occurring downstream from the reservoir.

Table 2:
Proposed List of Priorities of Clark Fork Operable Units

High Priority Operable Units
Mill Creek
Walkerville
Butte Priority Soils
Old Works Removal
Flue Dust
Warm Springs Ponds
Travona Flooding
Montana Pole
Mine Flooding (Berkeley Pit)
Rocker

Medium Priority Operable Units
SBC Area I (Metro Storm Drain—Colorado Tailings)
Streamside Tailings (Colorado Tailings-Warm Springs Ponds)
Smelter Hill
Clark Fork River
Milltown Reservoir
Anaconda Community Soils
Anaconda Site-wide Ground Water
Old Works (General)

Low Priority Operable Units
Butte Non-Priority Soils
Tailings (ground water/alluvium)
Arbiter
Smelter Wastes (Beryllium, Slag)
Anaconda Surface Water and Sediment
Agricultural Lands
Active Mine Area

Work on operable units shown in boldface has begun; this includes all high priority and most medium priority operable units.

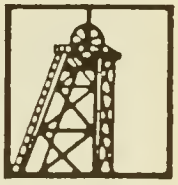
3.3.2 Anaconda Smelter Site

In 1984 ARCO began Phase 1 RI/FS activities under two consent orders from EPA. Efforts to control fugitive flue dust in the community of Mill Creek were also conducted under consent orders. Numerous Phase I reports were prepared, and one in particular, the health effects study, required refocusing the investigations toward the community of Mill Creek. An **Endangerment Assessment** completed by EPA during April 1986 indicated that young children in the Mill Creek community could be exposed to arsenic at levels which posed unacceptable health risks. In response to this potential risk, EPA provided for temporary relocation of families with small children. Following completion of an RI/FS and selection of a remedy in a **Record of Decision,** EPA and MDHES reached an agreement with ARCO under which residents of Mill Creek would be permanently relocated as an interim solution to health risks posed by arsenic and other heavy metals at this location. ARCO subsequently reached agreement with the residents. The dwellings will be demolished and the site fenced to prevent access. The remaining soils contamination issue will be addressed as part of the future Agricultural Lands RI/FS.

In September 1983, ARCO agreed to conduct additional investigations leading to remedies at the Smelter Hill, Old Works, and Flue Dust operable units. These activities will build upon the earlier work by ARCO.

3.3.3 Montana Pole Site

Since July 1985, the EPA Emergency Response Branch has been conducting a **Removal Action** to collect PCP and oil from surface and ground water. Over 10,000 gallons of PCP-contaminated diesel oil have been treated on-site and about 10,000 cubic yards of contaminated soils have been collected and stored on-site. Removal activities are phasing out and RI/FS activities leading to a final remedy are being initiated under MDHES lead responsibility.



3.3.4 Silver Bow Creek/ Butte Addition Site

In 1984, a Phase I remedial investigation was initiated by MDHES to evaluate levels of contamination in soil/tailings, ground water, surface water, and aquatic plants and animals in Silver Bow Creek and the Warm Springs Ponds. Phase II RI/FS activities, which are building on these initial investigations, are currently ongoing and include: selection of a remedy for the Warm Springs Ponds; a site-wide assessment of health and environmental risks; evaluation of possible remedies for streamside tailings along Silver Bow Creek and the Clark Fork River; and additional investigations and remedy evaluations for other operable units at the Silver Bow Creek site. At twenty-three homes in the Walkerville area, EPA removed contaminated soils and replaced them with clean soils during the Spring and Summer of 1988. In addition, responsible parties, including ARCO, New Butte Mining, and the City of Walkerville, removed and regraded several old dumps in preparation for reseeding and fencing.

4.0 THE SUPERFUND PROCESS

The 1980 Comprehensive Environmental Response, Compensation, and Liability Act, or CERCLA, provides EPA with broad authority to respond to releases and threatened releases of hazardous substances, contaminants, and pollutants that could endanger human health or the environment. The 1986 Superfund Amendments and Reauthorization Act (SARA) provides that the states be actively involved in planning and selecting remedial responses. Either EPA or the State of Montana may take the lead role in managing response actions at the Clark Fork sites. Since CERCLA was developed to address the entire spectrum of hazardous substance contamination problems throughout the country, the Superfund process is complex and comprehensive. EPA and MDHES have a number of mechanisms under CERCLA to address contamination problems in the Clark Fork Basin. Since each Superfund site in the basin may be somewhat unique due to site characteristics as well as technical and legal considerations, cleanups must be tailored to the specific needs of each site. Therefore, the Superfund process may involve different combinations of response actions at each site. The general approach and sequence of activities used at the sites is described below.

4.1 PRELIMINARY ASSESSMENT AND SITE INVESTIGATION

Preliminary assessments and site investigations to determine the need for follow-up response activities were performed throughout the Upper Clark Fork Basin beginning in about 1982. These evaluations, which provided general characterization of the hazardous substances and potential for human and environmental exposure, were based on a review of existing data and collection of some new data. The information led to the listing of four Superfund sites in the upper basin on the **National Priorities List.**

4.2 REMOVAL ACTIONS

EPA initiates Removal Actions to address situations posing relatively higher risks to human health and the environment at Superfund sites. Removal actions are short-term remedies which, to the extent practicable at the time of implementation, are to contribute to the efficient performance of long-term remedial action anticipated at the site. Under SARA, removal actions are limited to a maximum duration of 12 months and a $2 million maximum cost except in a few limited circumstances.

Removal actions have been used to address the more serious health risks at Mill Creek and Walkerville where high levels of contaminants were found in soils of residential areas. A removal action also occurred at the Montana Pole site to prevent seepage of oil into Silver Bow Creek. Removal actions may continue to be used when the magnitude of risks are significant enough that action must be taken before a long-term solution can be selected and implemented. Such future actions may include the Old Works (High Risk Area), Travona Shaft, and Timber Butte areas.

4.3 REMEDIAL ACTIONS

One important objective of a **remedial action** is a permanent, long-term solution. Following the preliminary assessment and site investigation, Superfund sites are addressed using a four-stage process. The four stages in this process are (1) the Remedial Investigation/Feasibility Study, (2) a Record of Decision, (3) the Remedial Design, and (4) a Remedial Action.

First, sites are studied in detail during a carefully designed effort known as a Remedial Investigation/Feasibility Study (RI/FS). During the RI/FS, the type and extent of contamination at a site are identified; cleanup standards are established on the basis of an evaluation of risks to human health and the environment (an Endangerment Assessment) and on a complete analysis of Federal, State, and local laws and regulations known as Applicable, or Relevant and Appropriate Requirements (ARARs); and remedial action alternatives which are available to remedy the problem are determined.

The remedial investigation and feasibility study phases proceed together. As field investigations, laboratory analyses, and data evaluations improve understanding of the type and extent of contamination, the range of remedial alternatives to be investigated can be narrowed. More specific data needs are then identified to assist in final selection of a remedial approach. Since this process involves a sequence of interactive steps, investigations at complex sites are often performed in phases which may lead to interim, partial remedies. These phases take a narrower focus and concentrate on key issues which must be addressed before a long-term remedy can be selected. This phased approach has been used at most of the Clark Fork Superfund sites.

Once an RI/FS is complete, a Record of Decision is developed which documents the Remedial Action selected for a site. The remedial action selected must: comply with cleanup standards (unless a waiver is granted); be cost effective; adequately protect health and the environment; be permanent; and utilize innovative treatment technology to the maximum extent practicable. A proposed plan, which is an abbreviated summary of the RI/FS and the preferred alternative, is developed and distributed. Once the remedial action has been selected, information concerning technical and legal considerations upon which the remedial action selection was based is included in the Record of Decision.

The **Remedial Design** phase involves development of detailed plans and specifications for conducting the specific remedial action at a site. Design specifications, construction plans and drawings are developed which incorporate engineering considerations and site factors. These plans and specifications provide a basis for evaluating performance of the final remedial action. This final remedial action consists of the construction and/or implementation phase. If a responsible party implements the remedial action, the EPA and/or MDHES provide oversight to ensure that specifications developed during the design phase are met.

4.4 SUPERFUND ENFORCEMENT AUTHORITIES

The Superfund laws give EPA authority to ensure that liable individuals, companies, or corporations responsible for hazardous waste contamination (known as responsible parties) pay for response actions.

The goal of the Superfund enforcement program is to encourage response actions by responsible parties through settlements with EPA and MDHES. Enforcement authorities will be used by EPA and MDHES to require response actions by known and viable responsible parties at each of the Clark Fork Superfund sites. Parties who may be responsible or liable for payment of Superfund response action costs or for compliance with administrative or judicial orders include companies that generated any hazardous substances found at a site, present and former owners of a site, transporters, and disposers of hazardous substances at a site. Superfund authorizes EPA to issue unilateral administrative orders to the responsible parties or to bring a judicial civil action against them to compel the conduct of investigations or to control releases or the threat of a release of hazardous substances at a site. Superfund also authorizes enforcement settlement agreements in the form of **Administrative Orders on Consent** and judicial consent decrees. Where **Potentially Responsible Parties** cannot be identified before response actions are implemented, the Hazardous Substances Trust Fund (Superfund) can be used to finance response actions. EPA can recover response action costs for any Superfund-financed activities from any and all responsible parties. The dollars recovered through this process go back into the fund for future response activities.

4.5 COMMUNITY INVOLVEMENT

Public participation is an integral part of Superfund and is required by the National Contingency Plan. The goal of community involvement is to encourage participation during the process of determining the best approach to response action at Superfund sites. To encourage community involvement in seeking solutions to the Clark Fork Superfund sites, EPA and MDHES have developed community relations plans which summarize concerns expressed by residents. During the course of Superfund site response actions these concerns are addressed through public meetings and in fact sheets which are distributed to update citizens on progress.

Before a Record of Decision can be developed for remediation of a site, EPA and MDHES must involve community residents and other citizens through the following steps:

- Public notice of the draft RI/FS and a brief analysis of the proposed remedial action plan must be published.
- Public comments on the draft RI/FS and the remedial action plan are received.
- A public meeting is held to receive comments and answer questions raised by citizens and interested parties.

- A transcript of the public meeting is developed for public review.

- Responses to each significant comment on the remedial action plan are developed in a responsiveness summary. This summary is incorporated into the record of decision.

As a result of the need to respond to immediate threats, the community involvement process during a removal action may be abbreviated.

The 1986 Superfund amendments also provide for a grant program which makes funding for technical assistance available to citizens who may be affected by releases of contamination.

EPA and MDHES will continue to pursue an active program of community involvement during response actions at the Clark Fork Superfund sites. This program involves periodic public meetings and distribution of fact sheets which describe investigations, plans, and schedules for remedial activities. Public meetings are announced in advance in local newspapers. Fact sheets are distributed to persons who request them. A mailing list is maintained and updated periodically for each site to ensure all interested parties are involved in this process.

This Master Plan is another important part of the Clark Fork Superfund community involvement effort. EPA and MDHES encourage public comment on this Plan. Updated information about this Plan will be provided in future fact sheets and public meetings.

Your comments should be addressed to:

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5.0 CLARK FORK SUPERFUND SCHEDULE

5.1 LONG-TERM SCHEDULE

To provide an overview of Superfund actions planned in the Clark Fork Basin, a schedule of activities anticipated during the next 6 years is presented in Figure 2. Approximately 80 percent of the 77 potential or existing contamination problems initially identified at the Superfund sites are currently in the investigation phase or have already had some remedial action. The remaining 20 percent will be responded to later. However, all potential or existing problems are included in the operable units shown in Figure 2.

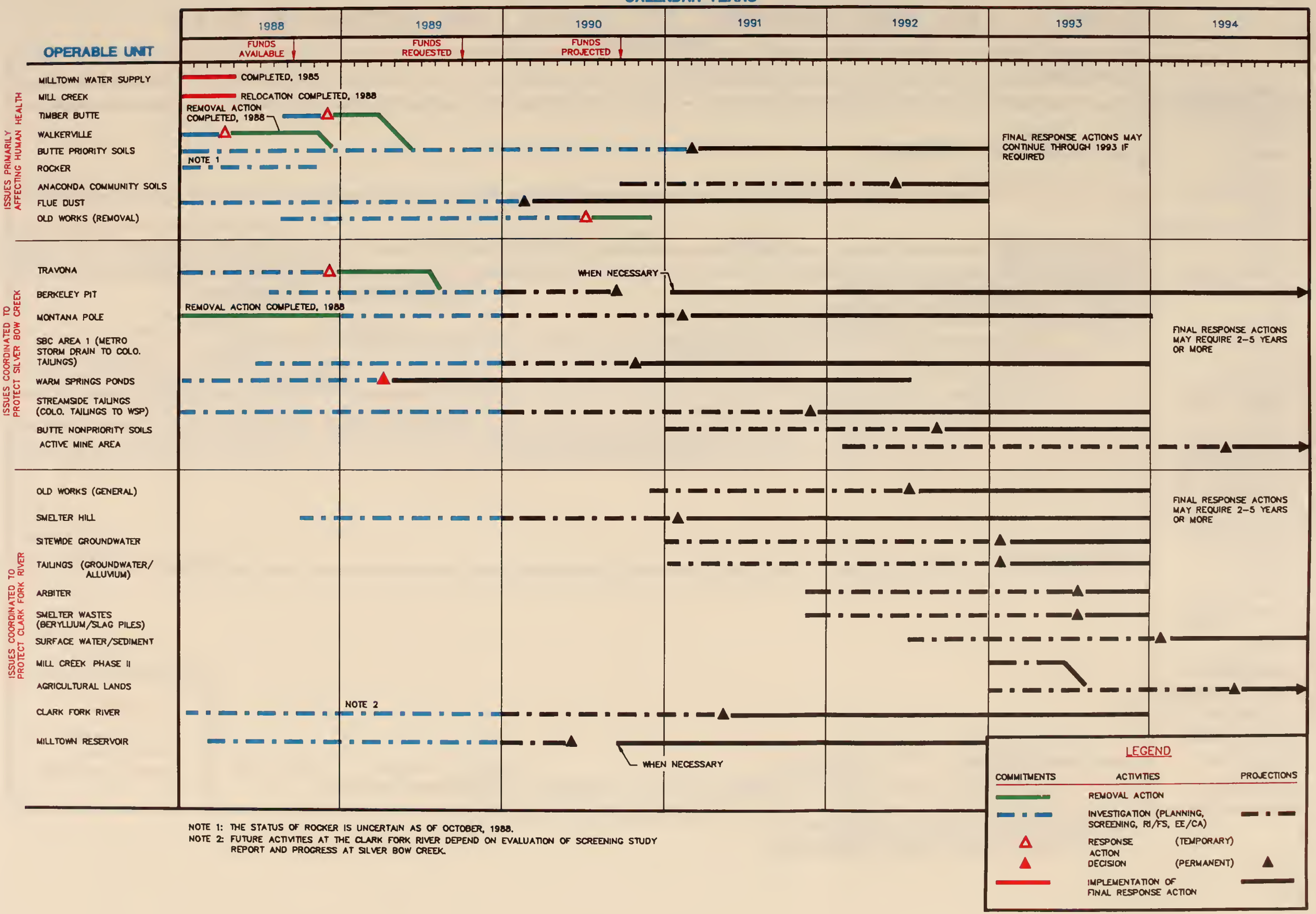
In reviewing Figure 2, it is important to note that activities shown beyond 1989 are best estimates of progress toward remediation. Factors which will affect progress during this period are new information concerning the extent of contamination and remedial approaches at the various sites and progress in negotiations with responsible parties. The schedule presented in Figure 2 will be updated and revised in response to influences of these factors as developments progress.

To aid in understanding how the various operable units may interrelate, they have been grouped into three general categories in Figure 2. The three categories include operable units that: (a) primarily relate to human health; (b) primarily affect water quality in Silver Bow Creek but may also have human health impacts; and (c) may affect water quality in the Clark Fork River but may also have human health impacts. There may be interrelationships among operable units within each category. For example, a final remedy for the Butte Mine Flooding (Berkeley Pit) Operable Unit must be closely coordinated with the Silver Bow Creek Area 1 remedy since a potential physical connection between the two operable units exists. Likewise, there may be interrelationships among the three categories. An example is the Butte Priority Soils Operable Unit which involves significant environmental impacts on Silver Bow Creek as well as human health concerns in local neighborhoods. These related operable units will be closely coordinated as planning and implementation activities are carried out.

While some of the Anaconda Smelter site operable units may not directly affect the Clark Fork River, they have been included in the third category since, by geographic location, any off-site impacts would more likely affect the Clark Fork River than Silver Bow Creek.

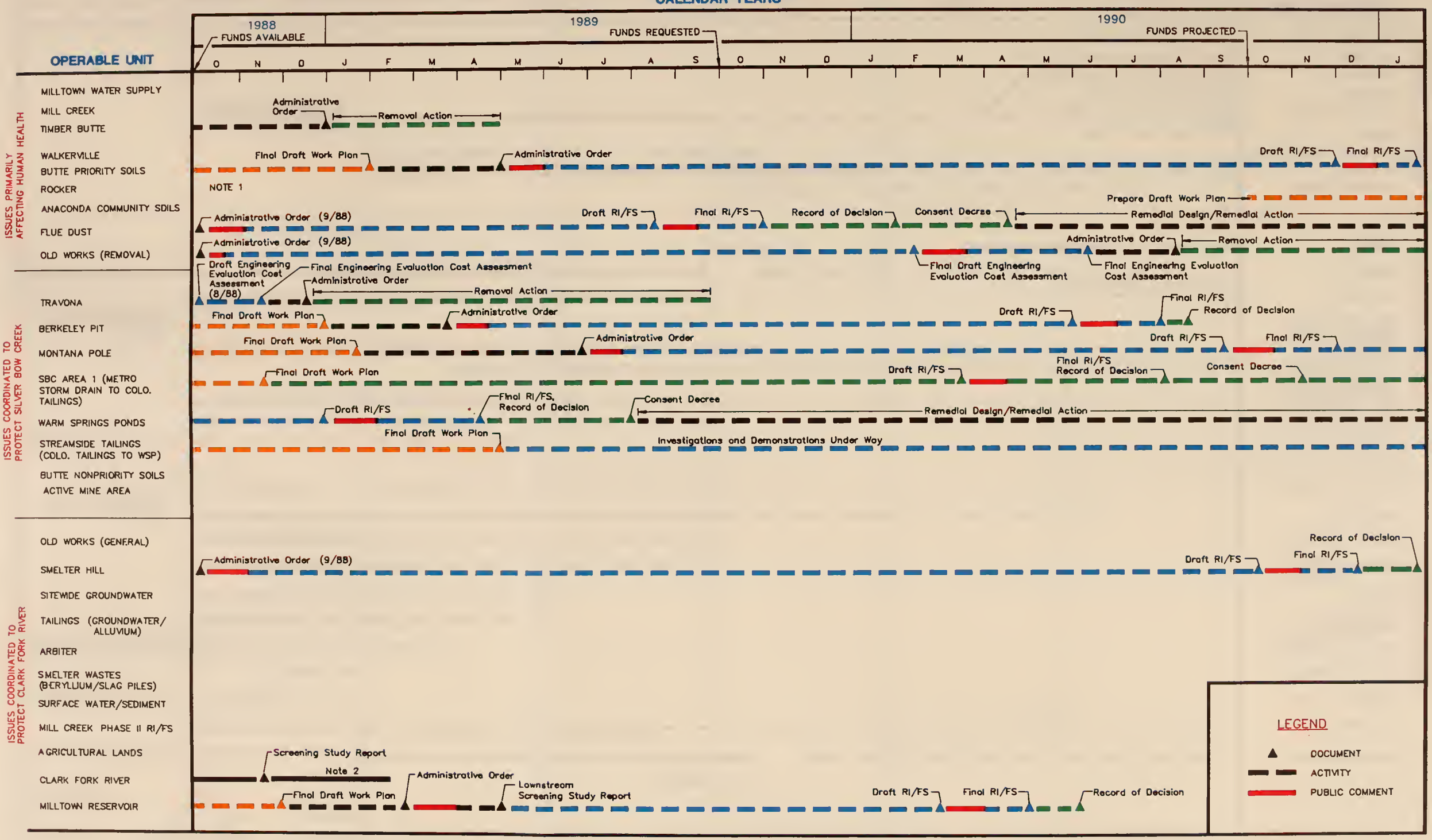
As indicated by the proposed schedule of activities, the highest priority operable units are generally those that have the greatest potential for impact on human health or the environment. These are the types of problems that are being addressed with interim response actions during 1988 and 1989 and are scheduled for final remediation first. Although the actual date for final remediation for each operable unit is generally not shown on the schedule, it is anticipated that remediation periods are likely to range from two to five years or more, based on the types of problems being addressed in the Clark Fork Basin.

FIGURE 2 LONG TERM SCHEDULE FOR CLARK FORK SUPERFUND SITES



NOTE 1: THE STATUS OF ROCKER IS UNCERTAIN AS OF OCTOBER, 1988.
NOTE 2: FUTURE ACTIVITIES AT THE CLARK FORK RIVER DEPEND ON EVALUATION OF SCREENING STUDY REPORT AND PROGRESS AT SILVER BOW CREEK.

FIGURE 3 TWO YEAR SCHEDULE FOR CLARK FORK SUPERFUND SITES



NOTE 1: THE STATUS OF ROCKER IS UNCERTAIN AS OF OCTOBER, 1988.

NOTE 2: FUTURE ACTIVITIES AT THE CLARK FORK RIVER DEPEND ON EVALUATION OF SCREENING STUDY REPORT AND PROGRESS AT SILVER BOW CREEK.

5.2 TWO YEAR SCHEDULE

A more detailed schedule of Superfund activities is shown in Figure 3 for those operable units under investigation and/or remediation during the 1989-1990 period. This schedule indicates the projected dates for investigations, reports, legal documents, public comment, and major decision points. Although there is more certainty with the near-term schedule, many of the previously mentioned factors affecting the long-term schedule are also relevant to this schedule.

These schedules represent a current snapshot of the ongoing and projected Superfund activities in the Clark Fork Basin as of October 1988. The schedules will be updated periodically and available for public review. As response activities and negotiations with responsible parties progress, the scope of these revisions will be clearer. EPA and MDHES welcome public comments on the information presented in this Master Plan.

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GLOSSARY OF SUPERFUND TERMS

Administrative Order on Consent: A legal and enforceable agreement signed between EPA and potentially responsible parties (PRPs) whereby PRPs agree to perform a Remedial Investigation and Feasibility Study (see definition below) or a removal action. The agreement describes actions to be taken at a site and may be subject to a public comment period. Unlike a judicial consent decree, an administrative order on consent does not have to be approved by a judge.

Endangerment Assessment: An investigation conducted as part of a Remedial Investigation that defines the risks posed to public health and/or the environment at a Superfund site.

Engineering Evaluation/Cost Analysis (EE/CA): A study conducted during an expedited response action to develop and design effective solutions to a particular problem at a site and to estimate costs of each solution as a basis for selecting an appropriate response action.

Operable Unit (OU): A portion of the overall investigation and remediation at a Superfund site. For example, EPA has identified management of contamination in the Mill Creek community at the Anaconda Smelter site as an operable unit of that site. During the course of remediation, a site may be divided into a number of operable units.

National Contingency Plan (NCP): Originally developed in response to the Clean Water Act of 1972 which regulated discharge of hazardous waste to water bodies, the NCP provides comprehensive guidelines and procedures for implementing hazardous waste responses under CERCLA.

National Priority List (NPL): EPA's list of uncontrolled or abandoned hazardous waste sites identified for possible remediation using Federal Superfund money. EPA is required to update this list at least once a year.

Potentially Responsible Party (PRP): An individual, company, or government body identified as potentially liable for release of hazardous substances to the environment. Under the Superfund program, EPA may hold liable any party that has produced, shipped, stored, processed, or handled hazardous wastes, or owned land on which these activities have been conducted.

Preliminary Assessment: The initial evaluation of potential hazards at a site which is performed by the State or EPA based upon all available information.

Record of Decision (ROD): The document prepared by EPA which documents selection of a cost-effective remediation.

Remedial Action: Implementation of a permanent solution to a health or environmental problem based upon investigations at a Superfund site.

Removal Action: An action taken over the short-term to address a release or threatened release of hazardous substances. For example, removal of contaminated soils in Walkerville was a Removal Action.

Remedial Design: The process by which detailed design plans and specifications are developed for remedial action of a Superfund site.

Remedial Investigation and Feasibility Study (RI/FS): Two different but related studies which are conducted in close coordination at a Superfund site. They are intended to:

- Gather the information necessary to identify the types, locations, and amounts of contamination at a Superfund site.
- Establish criteria for conducting remedial action at the site.
- Identify and screen alternatives for remedial action.
- Analyze in detail the technology and costs of the alternatives.

APPENDIX. CLARK FORK SUPERFUND SITES PROBLEM AREA SUMMARY

MILLTOWN RESERVOIR

Milltown Reservoir Sediments

- Sediments transported by Clark Fork River have accumulated in the reservoir. High levels of heavy metals contamination from upstream mining wastes.
- Source of ground water contamination.
- Contamination of drinking water supply.
- Potential source of contamination to Clark Fork River during flood events.
- Impacts to aquatic and terrestrial wildlife.
- Potential exposure of human populations to contaminated soils, sediments, and/or tailings.

ANACONDA SMELTER

Mill Creek

- Human health risks associated with exposure to soils contaminated by smelter emissions.
- High levels of arsenic, cadmium, and lead contamination.

Community Soils

- Potential human health risks associated with exposure to soils contaminated by smelter emissions.

Old Works

- Potential human health risks associated with exposure to soil and ground water contaminated by smelter emissions.
- Contamination of surface water quality from runoff.

Smelter Hill

- Potential human health risks associated with exposure to soil, air and ground water contaminated by smelter wastes.

Flue Dust

- Potential human health risks associated with exposure to smelter waste containing high levels of arsenic, cadmium, and lead.

Site-Wide Ground Water

- Potential for heavy metals contamination of irrigation and drinking water supplies.
- Potential contamination of Clark Fork River via recharge flows.

Opportunity Ponds

- Tailings pond wastes containing high level of heavy metals. Source of potential ground water and air contamination.

MONTANA POLE SITE

Montana Pole

- Timber treatment activities have resulted in high levels of organic contamination in soils and ground water.
- Human health risks associated with exposure to contaminated soil, ground water, and surface water.
- Source of PCP and petrochemical contamination in ground water and in Silver Bow Creek.
- Impacts to aquatic and terrestrial wildlife.

SILVER BOW CREEK

Silver Bow Creek Area I

- Surface soils and sediments, surface water, and ground water contaminated by mine and mill tailings and acid mine water discharges. High levels of heavy metal contamination.
- Contamination of potential drinking water supplies.
- Potential exposure of future human populations to contaminated soils and/or tailings.

Streamside Tailings

- Extensive deposits of mine tailings and sediments contaminated with heavy metals.
- Potential contamination of irrigation and drinking water supplies.
- Potential exposure of future human populations to contaminated soils and/or tailings.

APPENDIX. CLARK FORK SUPERFUND SITES PROBLEM AREA SUMMARY (cont.)

Rocker

- Soils contaminated with arsenic and potential organic contamination as a result of past timber treating activities.
- Potential for contamination of ground water and surface water.
- Potential human health risks associated with exposure to contaminated soil and ground water.

Warm Springs Ponds

- Contaminated surface water, pond bottom sediments, and ground water associated with treatment ponds built to capture mining waste from upstream sources.
- Potential for release of contaminated water and sediments due to instability of pond dikes during a flood or earthquake.
- Impacts to aquatic and terrestrial wildlife.
- Potential contamination of irrigation and drinking water supplies.
- Potential exposure of future human populations to contaminated soils and/or tailings.

Clark Fork River

- Floodplain sediments contaminated by mining wastes.
- Potential contamination of surface and ground water irrigation and drinking water supplies.
- Aquatic and terrestrial wildlife impacts due to exposure to contaminated sediments and surface water.
- Potential exposure of future human populations to contaminated soils and/or tailings.

BUTTE ADDITION

Timber Butte

- Human health risks associated with exposure to soils contaminated primarily with lead and arsenic.

Walkerville

- Human health risks associated with exposure to soils contaminated with lead, cadmium, arsenic, and mercury from mining waste.

Butte Priority Soils

- Human health risks associated with exposure to soils contaminated with lead, cadmium, arsenic, and mercury from mining waste.

Mine Flooding (Berkeley Pit)

- Underground mine workings and Berkeley Pit flooding and generating acid mine waters.
- Potential for discharge of acid mine water to Silver Bow Creek.
- Contamination of ground water.
- Potential impacts to aquatic and terrestrial wildlife.

Travona Flooding

- Underground mine workings flooding and generating acid mine waters.
- Potential for discharge of acid mine water to Silver Bow Creek.
- Contamination of ground water and potential drinking and irrigation water sources.
- Potential impacts to aquatic and terrestrial wildlife.

Butte Non-Priority Soils

- Source areas for fugitive dust contaminated with heavy metals.
- Source areas for surface water contamination from storm runoff.
- Impacts to aquatic and terrestrial wildlife resources resulting from exposure to metallic contamination.
- Potential exposure of future human populations to contaminated soils, waste rock, and/or tailings.

Active Mine Area

- Source areas for fugitive dust contaminated with heavy metals.
- Source areas for acid mine drainage discharge to Silver Bow Creek.
- Impacts to aquatic and terrestrial wildlife resources resulting from exposure to metallic contamination.
- Potential exposure of future human populations to contaminated soils, waste rock and/or tailings.